

CLAIMS

Claim 1 (currently amended): A method of interactively optimizing an engineering design, the method comprising:

assigning a baseline set of design values to a set of design variables for the engineering design;

conducting a sensitivity analysis on the engineering design to determine a set of performance factors, wherein each ~~of the set of~~ performance factor[[s]] defines an effect, on a set of metrics for the engineering design, of variations in a selected ~~one of the set of~~ design variable[[s]] over a range of values, while holding the set of design variables, except for the selected design variable, ~~one~~ at the baseline set of design values; and

manually changing one or more of the baseline set of design values based on the set of performance factors to generate an updated set of design values for the set of design variables.

Claim 2 (previously presented): The method of claim 1, further comprising:

conducting a simulation of the engineering design based on the updated set of design values to determine an output set of values for the set of metrics; and

evaluating the output set of values to determine whether the updated set of design values allows the engineering design to satisfy a performance criterion.

Claim 3 (previously presented): The method of claim 2, further comprising:

manually changing one or more of the revised set of design values based on the set of effects if the output set of values does not allow the engineering design to satisfy

the performance criterion, and if the set of performance factors is determined to remain accurate for the updated set of design values.

Claim 4 (previously presented): The method of claim 2, further comprising:

applying a structural change to the engineering design to generate an updated engineering design if the output set of values does not allow the engineering design to satisfy the performance criterion, and if the set of performance factors is determined to not remain accurate for the updated set of design values; and

performing, on the updated engineering design, the steps of assigning the baseline set of design values, conducting the sensitivity analysis, manually changing one or more of the baseline set of design values, performing the simulation, and evaluating the output set of values.

Claim 5 (previously presented): The method of claim 1, wherein conducting the sensitivity analysis comprises visually presenting the set of performance factors to a designer for review.

Claim 6 (currently amended): The method of claim 1, wherein conducting the sensitivity analysis comprises:

selecting one or more of the design variables;
selecting a simulation range for each of the one or more design variables;
selecting ~~a test~~ one of the one or more design variables;

performing a set of simulations on the engineering design using the baseline set of design values and varying

the ~~test~~ one of the one or more design variables over the simulation range for the ~~test~~ one of the one or more design variables to generate a test set of values for the set of metrics;

generating a set of test results for the ~~test~~ one of the one or more design variables by associating the test set of values with the simulation range for the ~~test~~ one of the one or more design variables;

repeating the steps of selecting the ~~test~~ one of the one or more design variables, performing the set of simulations, and generating the set of test results for each of the one or more design variables; and

compiling the set of test results for each of the one or more design variables into the set of performance factors.

Claims 7-8 (cancelled)

Claim 9 (currently amended): A system for interactively optimizing an engineering design, the system comprising:

storage means for associating a baseline set of design values for a set of design variables for the engineering design;

computing means for performing a sensitivity analysis on the engineering design to determine a set of performance factors, wherein each ~~of the set of~~ performance factor[[s]] defines an effect, on metrics for the engineering design, of variations in a selected ~~one of the set of~~ design variable[[s]] over a range of values, while holding the set of design variables, except for the selected design variable, ~~one~~ at the baseline set of design values;

display means for visually displaying the set of performance factors; and

means for allowing a user to select and change one or more of the baseline set of design values based on the set of performance factors.

Claim 10 (previously presented): The system of Claim 9, further comprising means for allowing the user to apply a structural change to the engineering design.

Claim 11 (currently amended): A software tool for controlling a computing system, the software tool comprising:

instructions for causing the computing system to store a baseline set of design values for a set of design variables for an engineering design;

instructions for causing the computing system to perform a sensitivity analysis on the engineering design to determine a set of performance factors, wherein each ~~of the set of~~ performance factor[[s]] defines an effect, on a set of metrics for the engineering design, of variations in a selected ~~one of the set of~~ design variable[[s]] over a range of values, while holding the set of design variables, except for the selected design variable, ~~one~~ at the baseline set of design values;

instructions for causing the computing system to graphically display the set of performance factors for a user; and

instructions for causing the computing system to adjust one or more of the baseline set of design values to generate an updated set of design values for the set of design variables in response to an input from the user.

Claim 12 (previously presented): The software tool of Claim 11, further comprising instructions for causing the computing system to perform a simulation of the engineering design using the updated set of design values to determine an output set of values for the set of metrics.

Claim 13 (previously presented): The software tool of Claim 12, further comprising instructions for applying a structural change to the engineering design.

Claim 14 (cancelled)